MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2016/2017 SESSION

TSE3251 & TSV3561 – SOFTWARE VERIFICATION & VALIDATION

(All sections / Groups)

3 March 2017
9.00 p.m. – 11.00 a.m.
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This Question paper consists of 6 pages with 5 Questions only.

2. Attempt **ALL FIVE** questions. All questions carry equal marks and the distribution of the marks for each question is given.

3. Please print all your answers in the Answer Booklet provided.

Question 1. **[10 Marks]**

a. Figure 1.0 shows the illustration of the Patriot Missile Defense System, an infamous software error case study that happened in Dhahran, Saudi Arabia in 1991.

PATRIOT MISSILE DEFENSE SYSTEM, 1991

The U.S Patriot Missile Defense System is a scaled-back version of the Strategic Defense Initiative ("Star Wars") program proposed by President Ronald Keagan. It was the first put to use in the Gulf Wars as a defense for Iraqi Scud missiles.

The software bug caused the system to fail to defend against several missiles, including one that killed 28 U.S soldiers in Dhahran, Saudi Arabia. In the Dhahran attack, the system had been operating for more than 100 hours.

Figure 1.0: Infamous software error case study

i. State two morales of the story that you can learn from it.
(2 Marks)

ii. Suggest two example to avoid the same crisis in the future.
(2 Marks)

b. Jacky is a tester in a software project. He doesn't seem to get along well with his other teammates, especially the programmers. Explain why this phenomenon happens. Give two examples.
(2 Marks)

c. Describe TWO means for Jacky to remedy the situation found in Q.1 (b) above.
[Hint: criteria for a good software tester] (2 Marks)

Continued .....

d. Assuming that you are a tester and you are given a task to test a piece of software that simulates functionalities of a Calculator. For each of the following incident, state whether a bug has occured. Justify the type of bug that occured in your answers.

i. The specification for the Calculator software states that it will perform correct addition, subtraction, multiplication, and division. During testing when you press the '+' key, nothing happen.

(1 Mark)

ii. As a tester, you find that the placement of the '%' key at the bottom of the numeric keypad has created difficulty in using the Calculator. The layout of the keypad is not mentioned in the specification.

(1 Mark)

Continued .....

Question 2. **[10 Marks]**

a. When conducting Static BlackBox Testing, tester needs to review the functions to be offered by the software carefully. Identify the ambiguity in the following statement in terms of testability. Based on the sentence below, write a new sentence with no ambiguity.

"The software allows more or less 10 million simultaneous connections although only half million from the number will normally be used."

(4 Marks)

b. Review process is important in making sure the software development work is successful. Name two types of Formal Review and explain each of it in detail.

(2 Marks)

c. Every tester must know how the review process take place. Draw a diagram showing how the Generic Review Process take place from the start until the end of the review process.

(3 Marks)

d. If a programmer was told that he could name his variables with minimum 5 characters, or more, and one of the characters must be capitalized, would that be a standard or a guideline? Explain.

(1 Mark)

Continued .....

Question 3. **[10 Marks]**

a. Differentiate between branch coverage and condition coverage. Which coverage is the best?

(2 Marks)

b. Why equivalence partitioning is important in testing activites?

(1 Mark)

c. Given a range of values between 888 and 10,001 inclusive, provide:

i) Two boundary values for the valid equivalence partition

(1 Mark)

ii) Two boundary values for the invalid equivalence partition.

(1 Mark)

d. Consider the program below, provide test cases with sample dates and times that would satisfy 100% condition coverage.

```
1. PRINT "Welcome"
2.    IF Date$= "01-01-2017" AND Time$="00:00:00" THEN
3.          PRINT " Happy New Year 2017!"
4.    END IF
5. PRINT "The date is: ";Date$
6. PRINT "The time is: ";Time$
7. END
```

(5 Marks)

Continued .....

Question 4. **[10 Marks]**

a. One of the benefits of test automation is the reduction of time and effort spent on testing especially for those 'test-to-fail' type of testing.

(i). What is meant by 'test-to-fail' with respect to testing. (1 Mark)

(ii). Name TWO types of testing for 'test-to-fail'. (1 Mark)

(iii). Explain why these TWO types of testing in Q4 a(ii) above could benefit from test automation in terms of reduction of time and effort. (2 Marks)

b. Explain how configuration testing could help to identify configuration problem rather than software bug. (3 Marks)

c. Give THREE motives for a hacker to break into a software system. (3 Marks)

Continued .....

Question 5. **[10 Marks]**

a. What severity and priority would you give to the following bugs. Justify your answers. (Note: Use scale of 1 to 4, 1 is being highest in severity and priority, 4 being the lowest in severity and priority)

i) The system suddenly crash and the data loss.
(1 Mark)

ii) Function has error and result is not correct.
(1 Mark)

b. Provide one entrance criteria and one exit criteria for one proposed test phase of your choice. The entrance criteria and exit criteria should objectively declare if the test phase is fully satisfied, and the next phase should begin.

(2 Marks)

c. Proper test case planning and tracking provides a means for proving what was tested or not tested. Describe TWO advantages of having proper test case planning.
(2 Marks)

d. Draw an organizational structure (diagram) where the quality assurance or test group, software development group and project manager have to report directly to executive management, and at the same time they have the most authority, the most independence, and the most responsibility role.

(4 Marks)

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